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Large animal urine/feces separator

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ABSTRACT

An inexpensive three-piece urine/feces separator has been developed which is suitable for long-term studies in large animals. The separator has proven effective in minimizing contamination of urine samples by fecal material, may be used without cleaning or other attention for extended periods of time and is quite simple to fabricate.

Collection of urine and feces for chemical analysis in animal experiments has traditionally been accomplished in metabolism cages of various designs. The most common form is a simple funnel placed under the animal's cage, with a medium mesh screen being placed above the funnel if separation of urine from fecal material is required (Chase and Rabinowitz, 1962; Kirschner, 1965; Wahmann, 1963; Weinhouse and Friedmann, 1951). Only with small rodents have more sophisticated techniques of urine/feces separation apparently been developed to date (Roth, et al, 1948).

In our laboratory a requirement developed for a method of primate urine/feces separation which would function effectively and without cleaning or other attention for periods of several months at a time. In the initial phases of the project a modification of the funnel-plus-screen technique was utilized; however, without frequent cleaning we found that contamination of the urine by fecal material was a continuous problem. The particular analyses required of the collected urine were such that this fecal contamination was unacceptable. In response to this requirement, a urine/feces separator has been developed which utilizes the relative surface tensions of the urine and fecal material to obtain their separation, the same principle used in the Roth rodent metabolism chamber cited above. The new separators have proven quite effective in minimizing contamination of urine samples by fecal material,

may be used unattended for long periods of time, and have the final virtue of being inexpensive to construct.

The large animal urine/feces separator is fabricated of 20 gauge stainless steel in three sections, as shown in Fig. 1. The upper two sections provide two halves of a quasi-funnel which together cover the entire area under the animal's cage. Section B of the separator is the key segment of this quasi-funnel. It extends well below the lip of section A and has a smoothly curved lower lip which guides the urine, held to the lip by the urine's surface tension, into collecting trough C. The urine so collected is then carried to any desired collecting point, in our study to a fractionator where it is stored for later chemical analysis.

At the same time, due to the slope of the quasi-funnel sides, the feces roll down section B and, due to their inertia, fall clear of trough C into a feces collecting tray below the trough. Experience has shown that the slope of sections A and B shown in Fig. 2 is adequate to insure the successful removal of most primate feces in this manner. It should be noted, however, that if in a particular application sticking of fecal material to funnel surfaces becomes a problem, the funnel sections may be covered with a fluorocarbon coating and the problem so eliminated.

The geometric orientation of the separator components is illustrated in Fig. 2, which also shows the feces collecting tray and the cage supports

to which the top edges of sections A and B are attached.

As stated earlier, this unit has proven simple and inexpensive (approximately twenty-five dollars) to fabricate, quite effective in minimizing fecal contamination of our urine samples, and may well be useful to other laboratories interested in such separation.

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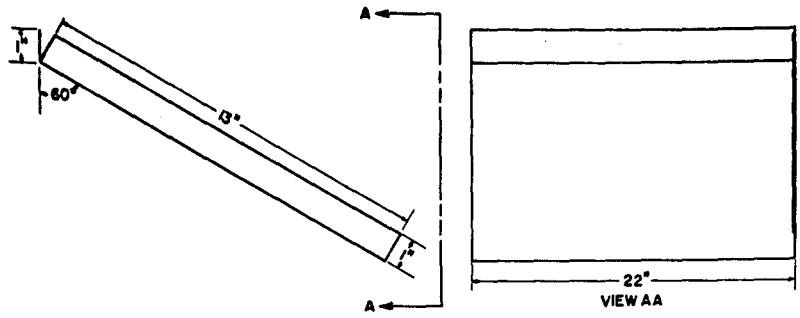
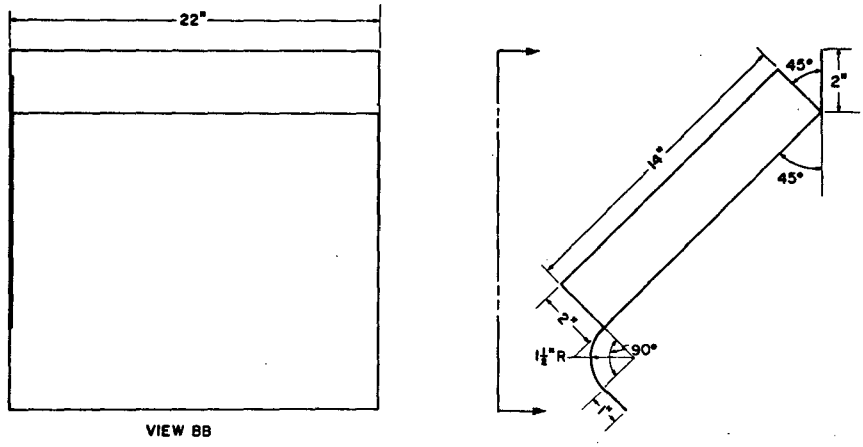
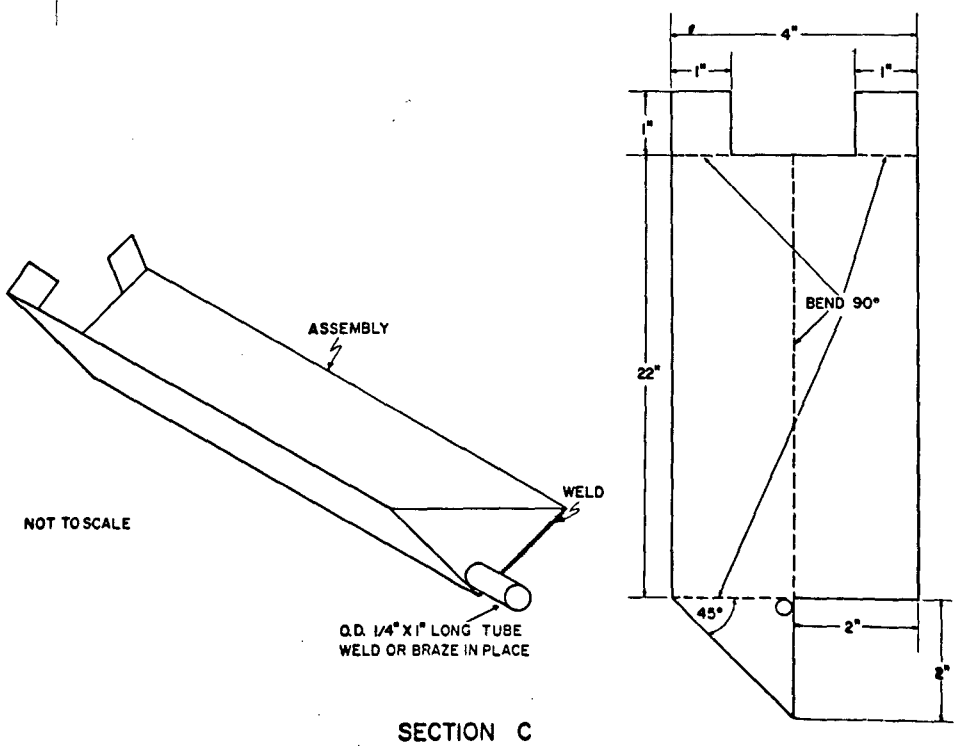
FIG. 1. Drawings showing details of urine/feces separator construction. Section A is upper half of quasi-funnel, section B is lower half and section C is collecting trough. All sections fabricated from 20 ga. stainless steel.



SECTION A



SECTION B



SECTION C

FIG. 2. Photograph illustrating assembly of urine/feces separator in primate chamber. Primate cage rests on supporting angles shown just above separator sections A and B; feces collecting tray shown on chamber floor.